CLAIMS :

1. A method of comparing a query fingerprint to a candidate fingerprint, the method being characterised by comprising: determining a statistical model of the query fingerprint and/or a candidate fingerprint and, on the basis of the statistical model, deriving a threshold distance within which the query fingerprint and the candidate fingerprint may be declared similar.

2. A method of matching a query object to a known object, wherein a plurality of candidate fingerprints representing a plurality of candidate objects are pre-stored in a database, the method comprising receiving an information signal forming part of the query object and constructing a query fingerprint therefrom and comparing the query fingerprint to a candidate fingerprint in the database, the method being characterised by the further steps of:

determining a statistical model for the query fingerprint and/or the candidate fingerprint; and

on the basis of the statistical model, deriving a threshold distance within which the query fingerprint and the candidate fingerprint may be declared similar.

3. The method of claim 1 or 2, wherein if a candidate fingerprint is found to be separated from the query fingerprint by a distance less than the threshold distance, and the distance between the candidate and the query fingerprint is less than the distance between any other candidate fingerprint and the query fingerprint, then the candidate fingerprint is declared the best matching candidate fingerprint and the candidate object represented by the best matching candidate fingerprint and the query object represented by the query fingerprint are deemed to be the same.

4. The method of claim 1, 2 or 3, wherein the statistical model comprises the result of performing an internal correlation on the query fingerprint and/or the candidate fingerprint.

5. The method of claim 4, wherein the fingerprints comprise a plurality of frames containing binary values and the statistical model is computed for the query fingerprint by determining a transition probability q for the query fingerprint by determining how many bits of a frame of the query fingerprint F(m,k) are different from their corresponding bit in their preceding fingerprint frame F(m,k-1) and dividing the number of transitions by a maximum value M*(k-1), which would be obtained if all fingerprint bits were of an opposite state to their corresponding preceding bit, where each fingerprint comprises M bits per frame and spans K frames, in which k is the frame index (ranging from 0 to K) and m is the bit-index within a frame (ranging from 0 to M).

6. The method of claim 5, wherein the threshold distance T is computed from the following equation based on a desired False Acceptance Rate (FAR):

$$FAR = \frac{1}{2}\operatorname{erfc}\left(\frac{1-2T}{\sqrt{2n}}\sqrt{\frac{1+(1-2q)^2}{1-(1-2q)^2}}\right)$$

7. Apparatus for matching a query object to a known object, the apparatus comprising a fingerprint extraction module (110) for receiving an information signal forming part of a query object and constructing a query fingerprint therefrom and a fingerprint matching module (210) for comparing the query fingerprint to candidate fingerprints stored in a database (215) to one or more candidate fingerprints, the apparatus being characterised by also comprising:

a statistical module (120) for determining a statistical model of the query fingerprint and/or one or more of the one or more candidate fingerprints;

a threshold determiner (120) deriving, on the basis of the statistical model, a threshold distance T within which the query fingerprint and a potentially best matching candidate fingerprint may be declared similar; and

an identification module (230) arranged such that if a candidate fingerprint is found to be separated from the query fingerprint by a distance less than the threshold distance T, and the distance between the candidate and the query fingerprint is less than the distance between any other candidate fingerprint and the query fingerprint, then the candidate fingerprint is declared the best matching candidate fingerprint and the candidate object represented by the best matching candidate fingerprint and the query object represented by the query fingerprint are deemed to be the same.

8. The apparatus of claim 7, wherein the statistical module (120) performs an internal correlation on the query fingerprint and/or the one or more candidate fingerprints.

9. The method of claim 8, wherein the fingerprints comprise a plurality of frames containing binary values and the statistical module (120) computes the statistical model for the query fingerprint or/and the candidate fingerprint by determining a transition probability q by determining how many bits of a frame of the query fingerprint F(m,k) are different from their corresponding bit in the preceding fingerprint frame F(m,k-1) and dividing the number of transitions by a maximum value M*(k-1), which would be obtained if all fingerprint bits were of an opposite state to their corresponding preceding bit, where each fingerprint comprises M bits per frame and spans K frames, in which k is the frame index (ranging from 0 to K) and m is the bit-index within a frame (ranging from 0 to M).

10. The method of claim 9, wherein the threshold determiner (130) computes the threshold distance T from the following equation based on a desired False Acceptance Rate (FAR):

$$FAR = \frac{1}{2}\,\mathrm{erfc}\left(\frac{1-2T}{\sqrt{2n}}\sqrt{\frac{1+(1-2q)^2}{1-(1-2q)^2}}\right)$$